Proposed Log Management Strategy For The Squamish Estuary

Squamish Estuary Management Plan

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PROPOSED LOG MANAGEMENT STRATEGY FOR THE SQUAMISH ESTUARY

Squamish Estuary Management Plan

Report of the
Log Management Work Group
to the Coordinating Committee

O.R.Travers : Chairman

Victoria B.C.
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FOREWARD

The Coordinating Committee for the Squamish Estuary Management Plan established the Log Management Work Group to assess the present needs for log handling in the estuary, to forecast future requirements, and propose ways to meet those requirements. The Coordinating Committee has carefully considered this report of the Work Group and fully supports its findings. The Work Group is highly commended for its efforts and substantial achievements. It's report is an excellent example of industry and government cooperation producing positive results.

T. J. Wood
Chairman
Squamish Estuary
Coordinating Committee

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1. INTRODUCTION

In May 1979, the Canada Minister of Fisheries and Oceans, and the British Columbia Minister of Environment jointly announced their intentions to direct their Ministries to prepare the Squamish Estuary Management Plan. The Squamish estuary, at the north end of Howe Sound is about 600 hectares in size. The estuary has rich biological productivity, particularly the fisheries resource. The estuary also provides very desirable marine access required by the forest industry, the railway and deep sea transportation systems. The downtown part of the town of Squamish is located there as well.

The forest industry has traditionally used Mamquam Channel, on the east side of the estuary for log handling activities. B.C. Railway owns most of the central and western side of the estuary. In 1972, a river training "wall" was built to confine the flow of the Squamish river to the west side, altering much of the erosional, fresh and salt water flow patterns. The central portion of the estuary remains relatively unaltered, except for reduced freshwater flow.

The Squamish Estuary Management Plan has attempted to resolve the long standing resource issues in the estuary, especially to decide how much land in the estuary should be conserved, and how much should be available for industrial use. Since the present and future needs of the forest industry in Squamish were of major concern to the Planning Committee, when the Management Plan was completed, they stated in recommendation 3.1.5:

"3.1.5 Log Handling and Processing Facilities

Logs being transported or stored on water should be bundled where sites permit, to reduce problems of bark and debris loss and sunken logs, and all logs should be securely retained within booming and handling areas. Dryland sorting and storage of logs is preferred (where feasible) to water-based sorting and storage, particularly over intertidal areas, in order to minimize

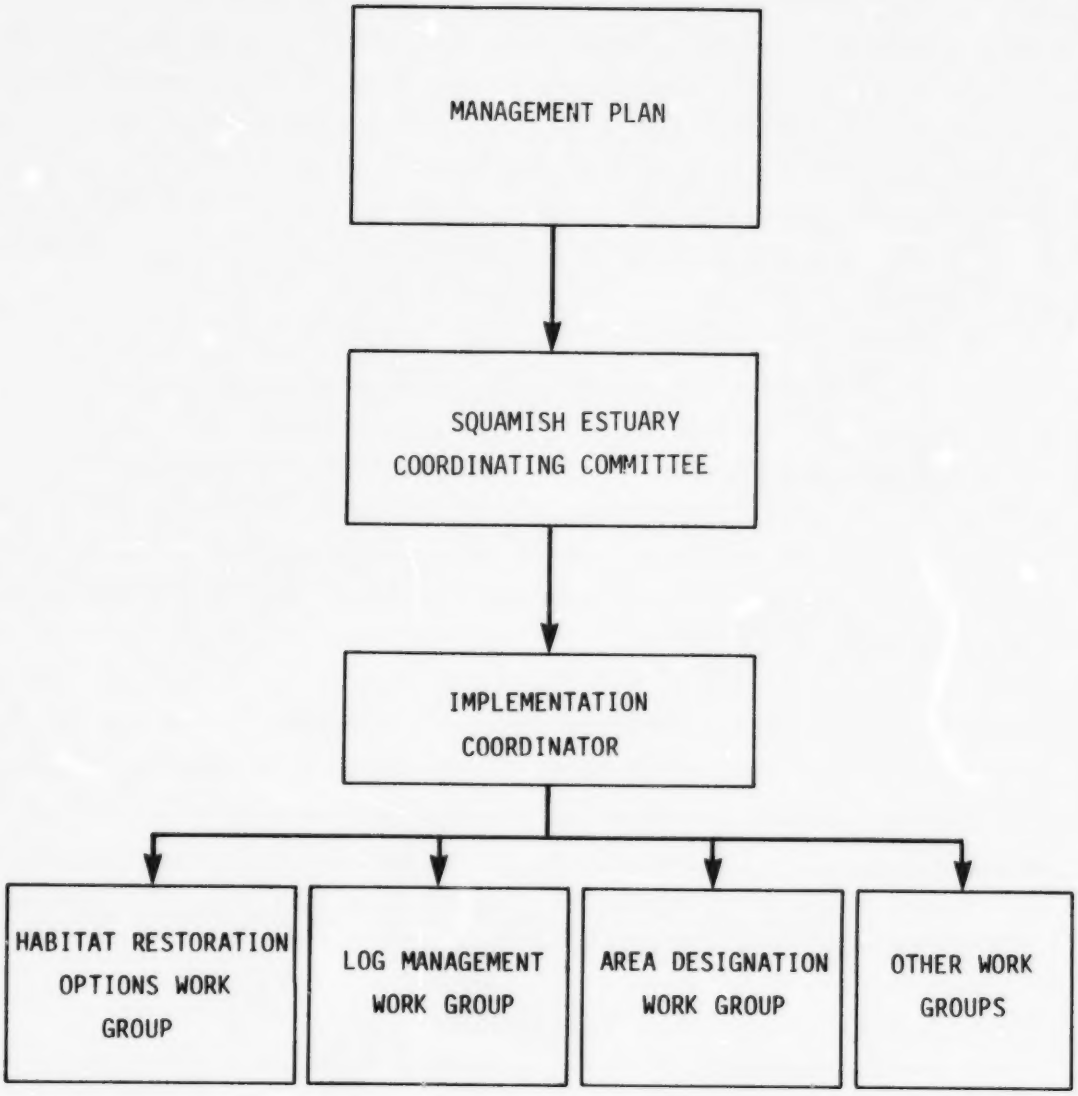

Figure 1 Study Organization.

interference with other water uses and potential degradation of water quality and habitat.*

Water-based log storage should be located where tidal or current flushing action is adequate to disperse polluting wastes. Logs should only be dumped, boomed, or stored where depths are sufficient to prevent grounding.

Water-based or dryland log storage operations should provide:

(i) easy let-down devices for placing logs in water;
(ii) positive bark and wood debris controls and disposal means at log dumps, booming areas, and millside handling areas; and,
(iii) means to control, collect, and discharge surface runoff in a manner which ensures protection for the quality of adjacent waters."

Accordingly the plan recommended that "a study should be done to recommend alternative means of handling and storing logs in the estuary."

Therefore in February 1986, the Implementation Coordinator of the Squamish Estuary Management Plan, Ken Lambertsen, called a meeting with the directly involved company and government representatives. As a result, the "Squamish Estuary Log Management Work Group" was formed, which reports to the Coordinating Committee as illustrated in Figure 1.

Membership of the Work Group is as follows:

R. Travers:	Chairman
N. Barr:	Squamish Independent Logger Association
H. Boas:	Ministry of Forests and Lands
K. Conlin:	Fisheries and Oceans Canada

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*Much of the log volume flowing through the Squamish estuary area requires minimal storage time, as the logs are enroute to processing facilities elsewhere.

P. Gilbert	Council of Forest Industries
R. Johnson:	Ministry of Forests and Lands
W. Leesing:	Council of Forest Industries
R. McIndoe:	Fisheries and Oceans Canada
B. MacFarlane:	British Columbia Development Corporation
C. Rathburn:	Weldwood of Canada

The Coordinating Committee provided the Work Group with Terms of Reference provided in Appendix 1.

From time to time, other agencies were asked to provide information required by the work group.

2. STUDY OBJECTIVES

The objectives of the Work Group are to make recommendations to the Coordinating Committee on a plan of action to:

a) meet the present (and for the foreseeable future) log handling requirements of the forest industry in the study area;
b) promote the orderly and efficient use of log sorting, storage, and transfer areas;
c) protect productive fisheries habitat;

3. STUDY CONTEXT

The planning horizon for the study is to look ahead for the next ten to twenty years, to the year 2006.

The study area includes all the Squamish Estuary, and a portion of Howe Sound, down to Watts Point on the east side and Woodfibre on the west side (Fig. 2).

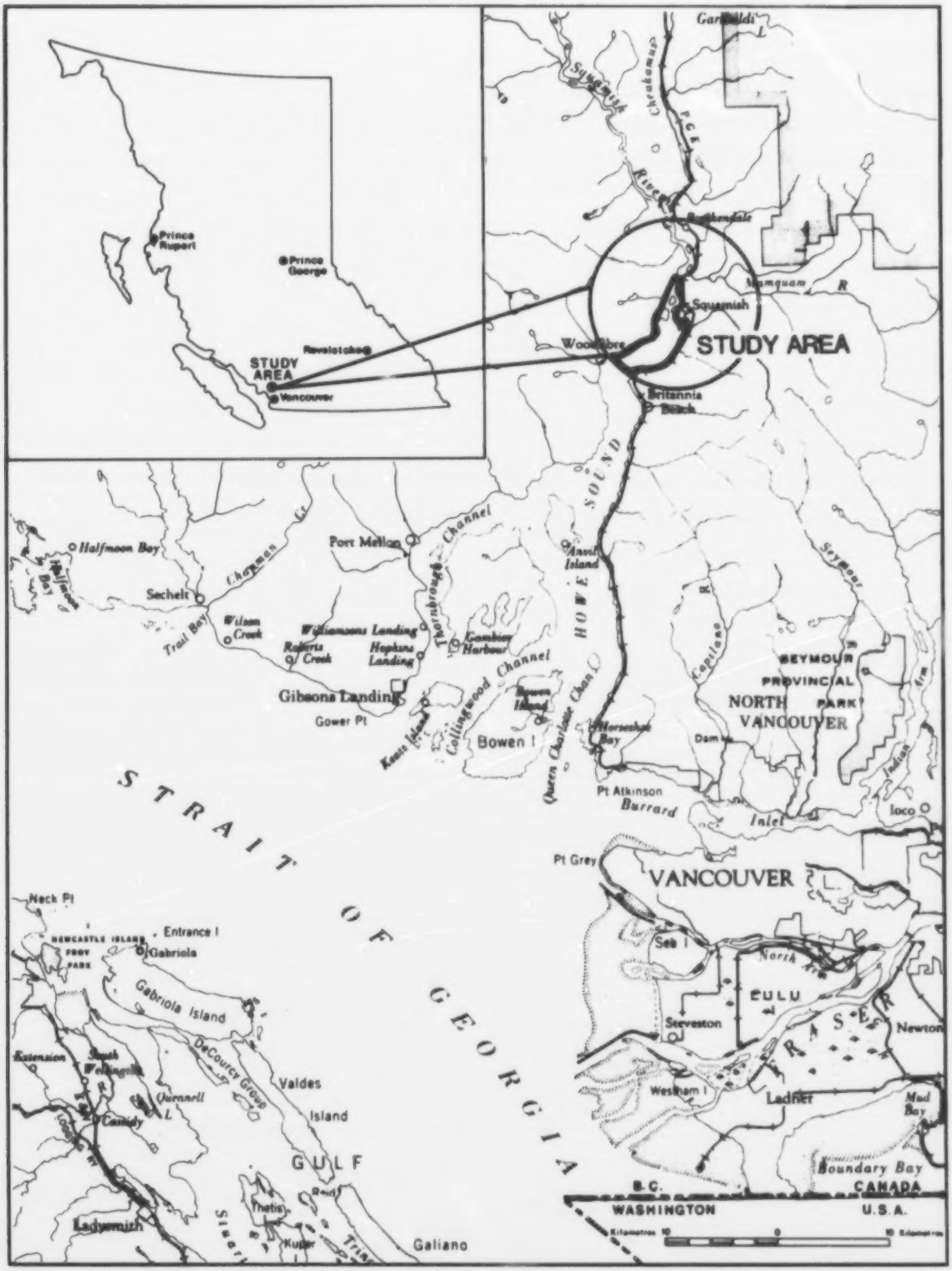


Figure 2 Study Area.

The Squamish Estuary component of the study area, has been designated in the Management Plan into proposed:

a) conservation areas;
b) industrial/commercial areas; and
c) planning assessment areas.

For each Area Designation, management objectives and policies were stated in the Squamish Estuary Management Plan. The Area Designations are illustrated in Figure 3.

4. ANALYSIS OF PRESENT AND FUTURE LOG HANDLING REQUIREMENTS

In the Squamish area timber is produced from several different forest tenures. In 1986, the annual log production was scheduled as follows:

Soo Timber Supply Area:	600,000 m^3*
Tree Farm Licence 38	263,800
Timber Licences	225,000
TOTAL	1,088,800 m^3

(Source: Ministry of Forests and Lands)

The actual 1985 annual cut was 966,300 m^3. Projecting into the future, overall annual log production is expected to decline.

*An additional 100,000 m^3 per year leaves via Harrison Lake.

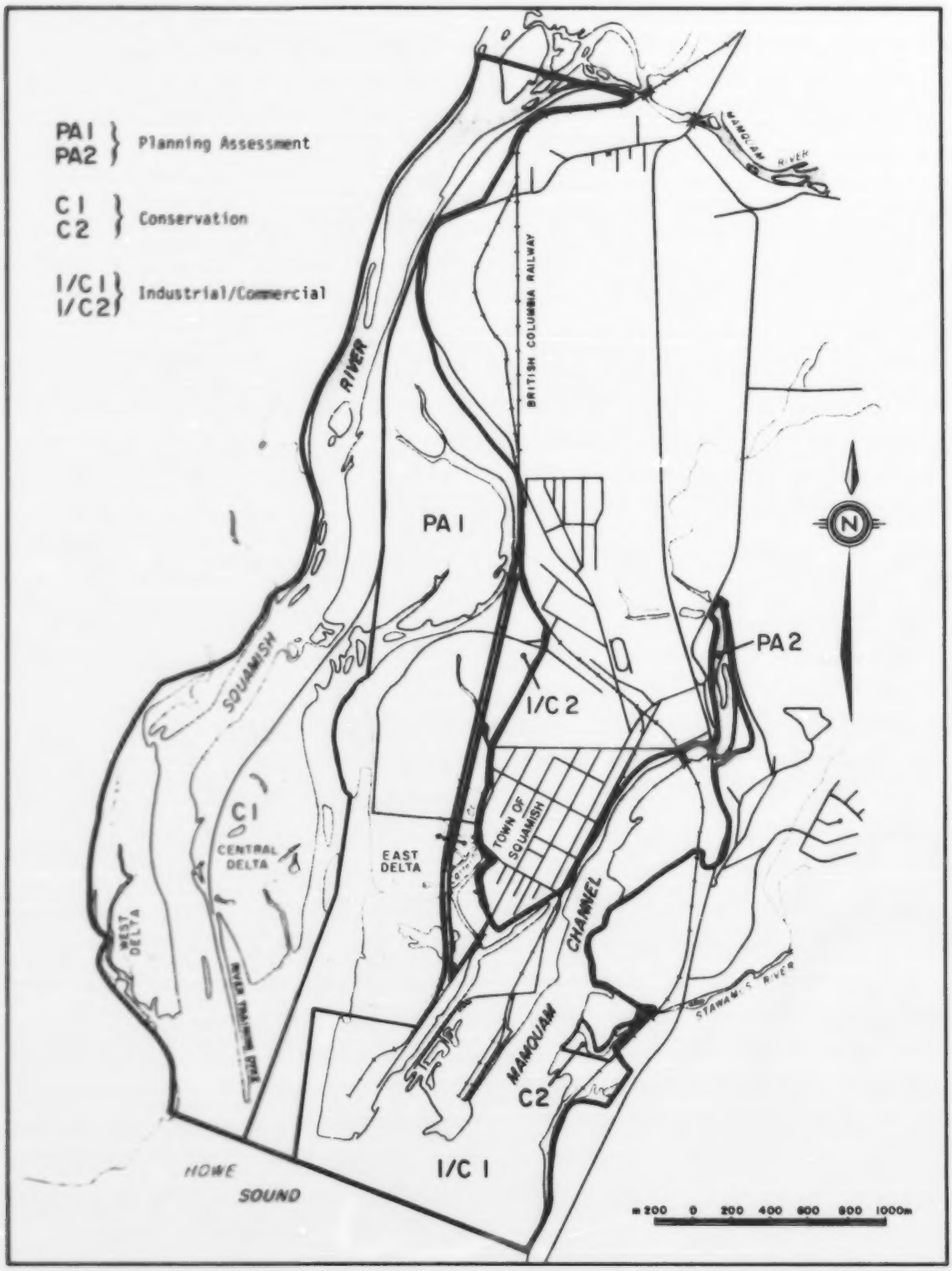


Figure 3 Area Designations.

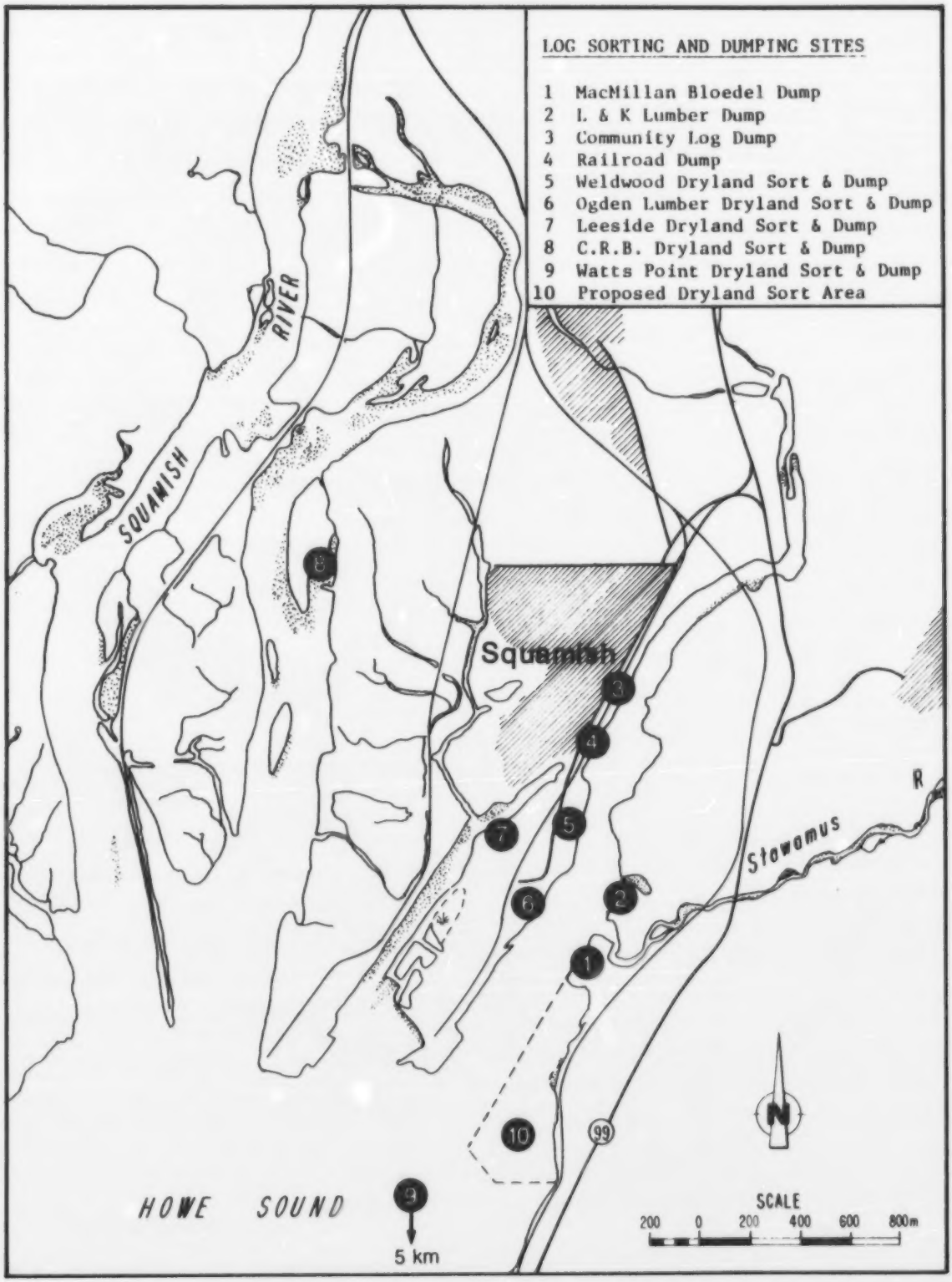


Figure 4 Log Sorting and Dumping Sites.

A re-analysis currently underway in the Soo TSA is indicating a decline of 10-15% for the next five year planning period. Tree Farm Licencee 38 annual volumes should remain stable. The Timber Licences could be completely logged in 5 years (Pemberton licences) to 14 years (Mamquam licences). This suggests a decline in annual cut of 2-300,000 m^3 within the next twenty years.

At present there are 11 different log handling operations in the study area. Of these, 8 are located in the estuary (see Figure 4). Seaward down the inlet, three more operations are found: Blackmount, Western Forest (Western Pulp) and Rivtow. For operations active in October 1986 the different types of log handling activities for each operation are described in Table 1. Table 2 demonstrates a surplus exists in present log handling capacity. The present allowable cut is 1,088,000 m^3/year for the estuary component of the study area. The effective operating capacity for existing facilities in the estuary area is estimated potentially to be 1,775,000 m^3/year.

The effective operating capacity, is a projection made by local operators of what could be handled in a practical sense, and is assumed to be 2/3 of the theoretical throughput. A more definitive projection would require a quantitative analysis of separate individual operations, with specific data on actual user needs. This was not considered necessary due to the amount of indicated excess capacity.

Since the recommendations were made in 1982 to study the need for additional log handling capacity, a number of significant changes have occurred. The CRB site in the Central Delta has been reactivated and expanded. The Leeside site has increased throughput, the Blackmount site has opened, and the users at the Ogden site have relocated, making this log handling capacity available. As a result, the forest companies (about 35) have sufficient log handling facilities (8 in the estuary). They have the option of negotiating for the services of log dumping and sorting, and obtaining the most satisfactory rate, subject to considerations such as adminstrative control of specific sites. Accordingly, under present

Table 1

Location and Type of Present Log Handling Activities in the Study Area
(October, 1986)

Location Operation	Log Handling Activity						
	Land			Water			
	Presort	Dump	Dry Land Sort	Water Sort	Boom	In Transit Storage	Storage
Water dumping (only)							
1 MacMillan Bloedel		✓			✓	✓	
2 L & K		✓			✓	✓	
3 Community Dump	some	✓			✓	✓	
Dryland sorting, water dumping and mill storage							
4 Railroad Dump	✓	✓			✓	✓	
5 a) Weldwood: Logging	✓	✓	✓		✓	✓	
b) Sawmill							✓
6 Odgen		✓	✓		✓	✓	
7 Leeside		✓	✓		✓	✓	
8 CRB		✓	✓		✓	✓	
9 Blackmount		✓	✓		✓	✓	
Water sorting and mill storage							
10 a) Western Forest-pulpmill				✓			✓
b) Western Pulp-pulpmill				✓			✓
11 Rivtow (was Point Grey)				✓			✓

Note there are three basic kinds of log handling operations in this area:

a) Water dumping (only)

b) Dryland sorting, water dumping and mill storage

c) Water sorting and (mill) storage

Table 2 compares current use (1987) with the effective log handling capacity, for operations in the estuary area:

Table 2

Comparison of Current Annual Production and Effective Operating Capacity of Existing Log Handling Facilities for Operations in the Estuary Component of the Study Area**

Operation	Number of Operators		Current Use (1987) Mm³/year	Effective* Capacity Mm³/year
Water Dumping				
1	(1)	MacMillan Bloedel	75	168
2	(1)	L & K	75	117
3	(8+)	Community Dump	225	214
			375	499
Water Dumping, Dryland Sorting and Mill Storage				
4	(0)	Railroad Dump	-	80
5	(1)	Weldwood	300	456
6	(0)	Ogden	-	214
7	(5+)	Leeside	215	355
8	(1)	CRB	65	134
9	1+	Blackmount	37	37
			617	1,276
Total Estuary Component of Study Area			992	1,775

*2/3 of maximum capacity, per year (annual operating season is nine months)

**Western Forest, Western Pulp and Rivtow have water sorting and mill storage sites down inlet on both sides of Howe Sound.

circumstances it is unlikely that any new additions to the current log handling capacity will be required in the estuary for the foreseeable future. Of course, flexibility is needed to accomodate changes that occur from time to time resulting from changing operating conditions.

5. REQUIREMENTS FOR PROTECTION OF FISH HABITAT IN THE ESTUARY

Prior to the confinement of the Squamish Delta by training walls, it was a rapidly prograding delta consisting of tidal flats dissected by channels. The tidal flat sediments are variable in texture ranging from sand and gravel in active distributary channels and bars, to mud in marsh areas and abandoned distributaries. Sediment distribution and dispersal patterns have been extensively affected by training walls and dredging activities. For a detailed (1:10,000 scale) map of the estuary's biophysical features see the February 1981 report of the Habitat Work Group, Squamish Estuary Management Plan.

Since construction of the Squamish main river training dyke in 1972, the majority of the river flow has been confined, resulting in increased current velocity, sediment loading, substrate instability, and erosion along the lower end of the delta. These conditions are believed to be responsible for the reduced algal productivity and low mean standing crop estimates in the west delta. Juvenile salmon access into the west delta marsh area is also restricted by the elevation differences along the foreshore. Juvenile salmon access to marsh areas occurs only at high river flows or at high tide periods.

Although the estuary has a detritus based food cycle, receiving 96% of its energy input and storage from vascular plants of the tidal marshes, the remnant 4% from algal production represents a significant food source, as well as providing cover for benthic invertebrates. Accordingly, any losses of algae production due to expansion of log storage or other activities in the central delta, should be minimized. The area of marsh habitat is slowly increasing in the central delta due to the accretion of sediments. These deposits are raising intertidal elevations, resulting in additional growth of

marsh plants. It is the Department of Fisheries and Oceans' position that log storage eventually should be phased out from the central estuary. This phase out should be timed to accommodate development of highly productive habitat.

a) Fisheries Resources Present

All five Pacific salmon species utilize the Squamish system for migration, spawning and rearing. Spawning escapements of chinook, coho and pink salmon have declined in recent years. These stock declines are not considered unique to the Squamish River drainage in that they have occurred in other systems along the coast. The decline in chinook salmon, however, does seem to be somewhat more severe than in most other areas. Many factors are believed to be involved in this decline. Chum escapements have fluctuated. During the past decade, significant effort has been made to enhance chum and coho stocks spawning in the lower Squamish River. A summary of average adult spawning escapements is listed in Table 3 and individual escapements depicted (1951-85) are all included in Figure 5. Populations of rainbow, cutthroat and steelhead trout are also present within the drainage.

Each salmon species has a unique life history pattern, and each depends on the estuary during the juvenile phase of its life history. Chum and pink salmon are similar and migrate directly to the estuary with little or no freshwater rearing. Pinks return to spawn at age 2 while chums return between ages 3-5. Coho typically rear for 1 full year in freshwater before entering the estuary and generally spawn at age 3. Chinook spend from 3 months to a year in freshwater prior to entering the estuary. The limited sockeye population is believed to rear at least 1 year in freshwater. The estuary rearing period is critical to the survival of the salmon stocks.

b) Fish Habitat in the Estuary

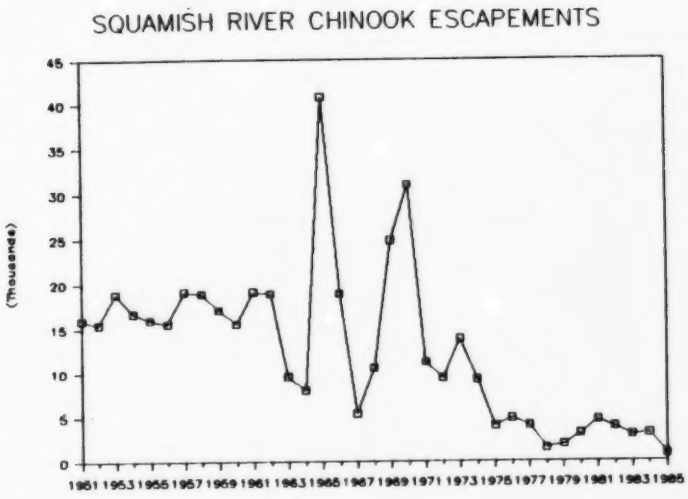
The major estuarine food sources of Squamish juvenile salmonids has been identified as Eogammarus confervicolus (epibenthic estuarine amphipod) and Neomysis mercedis (estuarine opposum shrimp). The

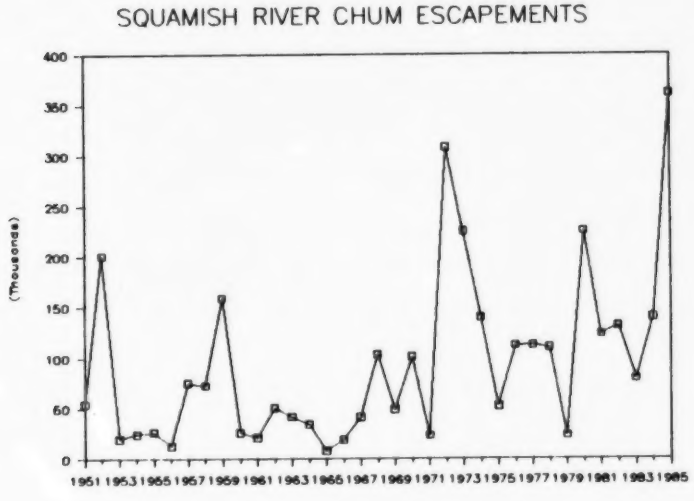
TABLE 3

SUMMARY OF SPAWNING ESCAPEMENTS TO THE SQUAMISH RIVER SYSTEM

YEAR	CHINOOK	CHUM	COHO	PINK	SOCKEYE
AVERAGE					
1951-60	16,925	66,968	32,443	160,955 a*	N/R
61-70	18,713	46,743	21,378	251,065 a	N/R
71-80	6,348	133,175	27,136	42,700 a	192
81-85	3,126	167,051	12,781	5,540 a	136

*a = odd year average





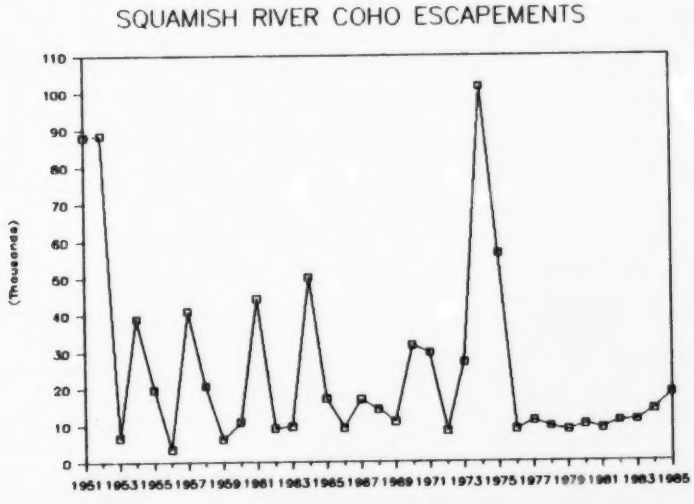
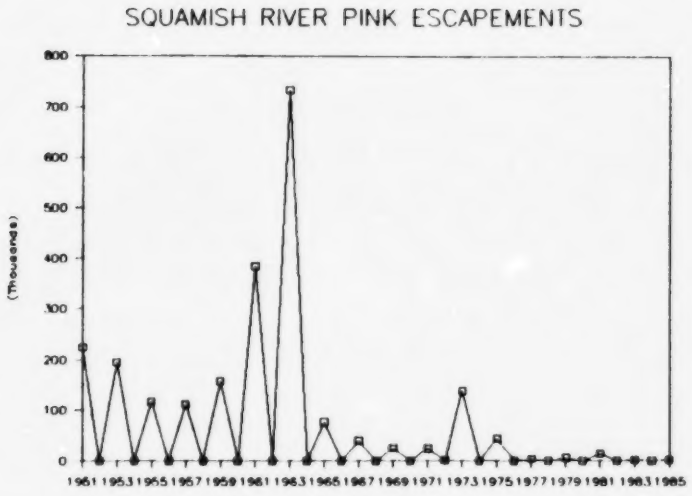


Figure 5 Squamish River Escapements.



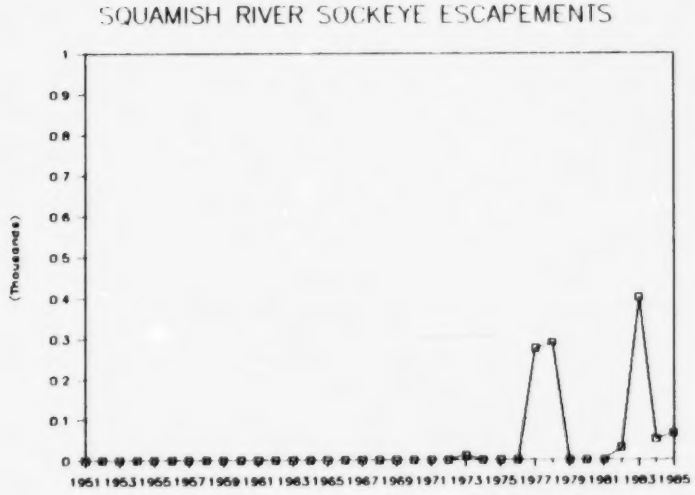


Figure 5 Squamish River Escapements. (continued)

former are the most important primary consumers utilizing living plant tissue and detritus materials. These amphipods are widespread throughout the delta but most abundant under sedge rhizomes and algal materials.

It is estimated that 96% of the annual net primary productivity on the delta is attributable to the marsh plant Carex sp. Algal production may also be important.

c) Habitat Losses in the Estuary

A substantial amount of intertidal fish habitat consisting of marsh and mudlfat has been lost due to industrialization and urbanization. There are only 38.3 hectares of remaining marsh vegetation on the west, central and east deltas. Since the training dyke for flood control was constructed in 1972, the Squamish River has been confined to the main channel. Resultant habitat losses from erosion along the lower end of the west delta river edge are estimated to have been 3 to 7 m annually. A substantial loss of intertidal marsh also occurred as a result of B.C. Rail's placement of dredge spoil in the central delta. Recent industrial and urban activities in the estuary have also resulted in losses. River training works are responsible for directing the majority of juvenile salmon directly into Howe Sound thereby reducing their opportunity for a gradual transition into the salt water.

d) Habitat Impacts of Log Storage

Possible effects of intertidal log storage regarding chemical and physical impacts upon estuary areas have been discussed at length in other reports. A checklist of the potential range of impacts is summarized in Table 4. Review of these possible impacts suggests that the most probable deleterious effect of log storage on the Squamish Estuary fishery resource is related to grounding/shading of intertidal substrate from booms and sediment scouring in conjunction with towboat prop wash.

TABLE 4
CHECKLIST OF POTENTIAL IMPACTS
OF INTERTIDAL ESTUARINE LOG STORAGE

Potential Impact	Direct Effect	Indirect Effect	Significance
Shading	Decreased primary production by microalgae (planktonic, benthic, macroalgae, eelgrass).	Altered food chains.	Significant
Grounding abrasion	Destruction of plants epifauna, drainage channels. Sediment compaction.	Destruction of food chains, lost "living space".	Significant
Reduced current and wave action	Increased sediment deposition, increased fines, debris retention, decreased sediment flushing.	Altered food chains, lost "living space", chemical changes.	Less significant
Leachates, debris	Toxicity, increased B.O.D.	Decreased, altered flora and fauna.	Less significant
Towboat prop wash	Disturbance and destruction of flora and fauna.	Decreased production, altered communities.	Significant

Source: Modified from the Fish Habitat Sub-Committee Report of 1980 to the Nanaimo Estuary Steering Committee.

e) Summary

Quantifying the overall impact of log storage in the Squamish Estuary on the fisheries resource is difficult. Generally, juvenile salmon that reside in the estuary compared to those that migrate directly into the marine environment have an increased survival rate. Environmentally sound log storage practices are needed to prevent losses to fish habitat. This is critical in estuaries such as the Squamish where substantial amounts of highly productive fish habitat have been lost in the past. The fish habitat protection objective is to ensure that no further habitat is lost and attempts will be made to increase fish habitat, where possible.

6. MAMQUAM DREDGE DISPOSAL SITE

Simultaneously with the deliberations of the Log Management Work Group (LMWG), work was proceeding in 1986 on the creation of the Mamquam Dredge Disposal Site (Crown Lot 5619, Gp 1 N.W.D.). This site had been proposed as a dryland log handling facility in a report prepared by Swan Wooster Engineering Ltd. for the Squamish and Howe Sound Chamber of Commerce. On October 28, 1985, Public Works Canada (PWC) submitted an application to the Environmental Protection Service of Environment Canada to conduct maintenance dredging of Mamquam Channel and to dispose of the dredged material on a sand/mud flat adjacent to the Channel. A total of 122,000 m^3 of material was to be disposed. PWC believed that the fill would contribute to the initial development of the site. To assist in this regard, the British Columbia Development Corporation obtained a map reserve on Lot 5619 from the Lands Branch of the then B.C. Ministry of Lands, Parks, and Housing.

As the proposal was within the area covered by the Squamish Estuary Management Plan, it was referred to the Squamish Environmental Assessment Committee (SEAC) for review. On November 29, 1985, SEAC sent a letter to PWC stating that although it did not object to the dredging operation, SEAC believed the filling of the site was premature due to the conceptual, pre-feasibility nature of the Chamber of Commerce's proposal. PWC was encouraged to review alternative disposal sites. Subsequently, the

Department of Fisheries and Oceans and the Fisheries and Wildlife Branches of the B.C. Ministry of Environment and Parks indicated to PWC they did not approve of the use of the sand/mud flat as a disposal site as intertidal habitat would be lost.

To assist PWC in the identification of disposal site alternatives, SEAC members met with PWC representatives in Squamish on January 8, 1986. The on-site review of four alternative sites provided the basis for a revised PWC proposal. The Squamish Estuary Coordinating Committee (SECC) met with agency, public and industry representatives on January 9, 1986.

Based on the alternative proposal developed by PWC and SEAC in Squamish and the input from SECC, conditional approval of the revised proposal was recommended by SEAC. The major objectives and conditions were to keep the fill area at the Mamquam Channel site as small as possible, to minimize intertidal habitat loss, and to compensate for habitat loss on an equal area basis. The compensation would take the form of removal of dredge material at the B.C. Rail dredge disposal site on the Central Delta to permit the reestablishment of marsh vegetation.

These conditions were accepted by PWC on February 19, 1986, and the actual dredging and disposal program was completed in April, 1986. In September, 1986, DFO and PWC came to an agreement regarding the area of vegetation impacted by the fill and the associated compensation requirement. PWC is continuing to negotiate with BCR regarding permission to use the training wall dredge disposal site for compensation purposes. Serious concerns regarding the stability of the fill site and the impact of the deposition of eroded material on adjacent properties have been expressed by a number of parties, both before and since the initial dredging was completed. Negotiations regarding a solution to the issue are ongoing.

At the time of writing of this report (February, 1987), BCDC has decided to withdraw its reserve over the dredge disposal site. (Crown Lot 5619, Gp 1 N.W.D.). Some local logging companies, who currently process logs through other sites, have recently submitted proposals to the Ministry of Forests and Lands to use the dredge disposal site for a new log handling facility.

Whatever agency or company eventually develops the site, if indeed such action is ever taken, there will be a need for a considerable capital investment.

7. DISCUSSION

The purpose of the Squamish Estuary Management Plan is to provide a cooperative framework for meeting the needs of all estuary users. The Squamish Estuary Coordinating Committee which implements the plan provides a operative forum for identifying those needs, for setting policy, for problem solving and conflict resolution. The LMWG was established to provide the Committee with specific conclusions and recommendations for meeting the needs for log handling users in the estuary.

In setting about its work, the LMWG's first task, in light of Recommendation 3.1.5 (noted in page 1 of this report), was to answer the question "Is there a need for additional log handling and storage areas in estuary?"

Three basic kinds of information were assembled:

a) A land status map showing the location of crown log storage leases, B.C. Railway leases, and private land.

b) A habitat map showing the location of estuary habitat units.

c) Data on current and projected annual timber volumes, by log handling facility in the study area.

Since Recommendation 3.1.5 of the Management Plan was made in 1982, the LMWG found that changes in use, changing economic conditions, and revised projections of allowable cut from the Soo TSA, have all combined to alter earlier perceptions of the need for any additional log handling facilities.

As well, since 1982, local interests in Squamish such as the Chamber of Commerce have presented their ideas concerning rationalization of use and expectations of future log handling needs. In a 1985 report "Pre-Feasibility Study of a Log Handling Facility on Mamquam Channel" prepared for the Chamber of Commerce, a multi-user centralized log handling facility was recommended. This proposal suggested that some present log handling sites near the townsite on the west side of Mamquam Channel could be relocated to the proposed new multi-user facility. This would free these sites for other commercial and tourism uses, and would reduce industrial traffic. This proposed relocation was outside the scope of this study and was not considered.

The findings of the LMWG show that existing (1987) log handling facilities in the estuary area can accommodate the present and foreseeable total needs for log handling and storage (see Chapter 4). The Mamquam dredge disposal site is still available for relocation of existing log handling operations, new log handling operations, or for other industrial uses requiring marine access.

The LMWG found ambiguity in the interpretation of what is considered to be the appropriate use in the proposed area designations. While the designations may suggest a priority for industrial or conservation usage, depending on the area, actual regulation of use does not always reflect the priority stated for the area. This is especially a concern in the area designated as industrial.

The requirement to replace habitat lost to development seems inconsistent with the Industrial/Commercial designation. Likewise, retention of development options on land owned by B.C. Rail seems inconsistent with the Conservation designation. The Coordinating Committee therefore formed the Area Designation Work Group (see Introduction, Figure 1) which is currently developing refined area designations for the Management Plan. These refinements should reduce, and hopefully eliminate, ambiguities in the interpretations of present area designations.

Finally, the LMWG would have benefitted from a clearer understanding of the relationship between log handling impacts and fish production. While

types of log handling impacts on fish habitat have been documented in reports such as "Water Transportation and Storage of Logs" by J.R. Sedell and W.S. Duval, the relationship between log handling and fish production requires more research. Better information is needed to more confidently determine safe limits for industrial use of estuaries, without unnecessarily risking a decline of fish production directly attributed to estuary use and habitat loss.

8. CONCLUSION AND RECOMMENDATIONS

The Log Management Work Group concludes:

a) No new log handling areas for the foreseeable future are required in the estuary for existing operators in the Squamish study area.

The Log Management Work Group recommends:

a) The Mamquam dredge disposal site should continue to be available for industrial use requiring marine access. These uses could be for log handling if desired, or for any other industrial use.

b) The Work Group on area designations (zoning) should more clearly define the terms "conservation" and "industrial-commercial", thereby reducing uncertainty while adding clarity to the policies and procedures for managing land use in the estuary.

c) The Department of Fisheries and Oceans should continue and expand upon its on-going field studies to assess the direct impacts of log storage and transportation. One study, proposed for the north arm of the Fraser River, to clarify the relationships between fish habitat and actual fish production, should provide relevant information applicable to the Squamish Estuary. The above proposed program is designed to identify and compare the production of fish food organisms to juvenile salmonid utilization for three fundamental shoreline areas namely riparian, intertidal marsh and mud/sandflat.

Such data would be used to identify habitat areas where log storage may present significant impacts to juvenile salmonids.

d) The log management strategy should be status quo for the existing log handling use of the estuary, no reduction in areas used, and flexibility for existing/new log handling operations to relocate between existing sites and/or a possible new facility on the Mamquam dredge disposal site.

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10. APPENDIX

SQUAMISH ESTUARY MANAGEMENT PLAN
A PROPOSAL FOR THE PREPARATION OF A LOG HANDLING STRATEGY FOR THE SQUAMISH ESTUARY

BACKGROUND

The storage, handling and use of logs continues to be a predominant activity in the Squamish estuary. Because it has been difficult to find both operationally and environmentally suitable sites to accommodate these activities, it was recommended in the Squamish Estuary Management Plan that a log handling and storage study be prepared for the Squamish estuary (E.3.1).

With implementation of the Management Plan, the need for analysis of log storage and handlng demands, and the development of a common strategy for accomodating these activities has been reinforced. Proposals for new or expanded sites have been difficult to evaluate against associated environmental impacts in the absence of an overall strategy for consolidating log handling needs in the estuary. The Squamish and Howe Sound Chamber of Commerce's "Pre-feasibility Study of a Log Handling Facility on Mamquam Channel" provides a useful start. However, in addition to reviewing the acceptability of the concept developed in this study, the log handling strategy under the Management Plan must be broadened to address the full scope of the problem and identify a cooperative, acceptable solution involving all affected parties.

OBJECTIVE

The objective will be to develop a strategy for providing sufficient log handling and storage sites in the Squamish area, while limiting environmental losses in the estuary. The primary tasks will be to:

1. document the existing supply and demand for various types of log storage and handling facilities, and associated site requirements;

2. forecast future demand for each type of facility;
3. examine to what extent reorganizing use of existing sites can result in more efficient utilization of them;
4. identify potential new sites which could meet present and forecast demands; and,
5. recommend a strategy for implementing proposed changes for log handling in the estuary.

All of the tasks are to be performed using an integrated perspective by taking economic, transportation, operational and environmental considerations into account. The intent would be to have the strategy applied by both industry, through operational practice, and by government through decisions on leases, permits and approvals.

APPROACH

It is recommended that a small team be established to prepare terms-of-reference and to develop the log management strategy. Involving the affected parties in a consensus building approach to developing the strategy is the key to gaining the cooperation necessary to implement the results. Potential participants may include: Ministry of Forests, Ministry of Lands, Parks and Housing, Ministry of Environment, B.C. Rail, Fisheries and Oceans Canada, Environment Canada and logging industry representatives. However, the team should not exceed six members. Other interests could be involved as resource specialists on specific issues that arise. The team will be co-chaired by one respresentative each from industry and government. Consideration may be given to splitting into sub-teams to handle different components of the work.

The details and timetable for developing the strategy will be reviewed by the Coordinating Committee prior to initiating work. As work progresses, the team will provide the Committee with regular progress reports and/or meeting minutes. These updates will also be deposited in the management Plan's Info Bank.

INITIATION

The following steps are recommended:

1. Coordinating Committee approval for preparation of a Squamish Estuary Log Management Strategy as proposed in the document. Implementation Coordinator to serve as liaison between the Committee, the team and other interests.
2. Participants nominated from among organizations on the Coordinating Committee.
3. Coordinating Committee Chairman writes to Ministry of Forests and industry representatives requesting their participation.
4. Co-Chairman selected.
5. Initial meeting and preparation of work plans and timetable for completion.
6. Coordinating Committee review and approval of work plan and timetable.
7. Preparation of strategy including regular progress reports.
8. Circulation of a draft report containing the strategy for comment.
9. Publish final strategy report and procees with implementation procedures.